

to the periodic table IVA, VA, VIA, VIIA and VIIIA in a content calculated as metal element of not lower than 0.01 weight percent.

55. The sintered body of claim 54, comprising said transition metal element in a content calculated as metal element of not higher than 1.0 weight percent.

56. The sintered body of claim 54 comprising crystalline phase of the nitride of said transition metal element.

57. The sintered body of claim 42 having an activation energy of temperature dependency of volume resistivity from room temperature to 300°C of not higher than 0.4 eV.

58. A member used for the production of semiconductors, wherein at least a part of said member is made of an aluminum nitride sintered body containing samarium.

59. The member of claim 58, wherein said sintered body has a volume resistivity at room temperature of not lower than $1 \times 10^8 \Omega \cdot \text{cm}$ and not higher than $1 \times 10^{13} \Omega \cdot \text{cm}$.

60. The member of claim 58, wherein said sintered body contains samarium in a converted content calculated as samarium oxide of not lower than 0.04 mole percent and aluminum nitride phase and samarium-aluminum complex oxide phase.

61. The member of claim 60, wherein said samarium-aluminum complex oxide phase comprises $\text{SmAl}_{11}\text{O}_{18}$ phase.

62. The member of claim 60, wherein said samarium-aluminum complex oxide phase forms network microstructure.

63. The member of claim 58, wherein said aluminum nitride sintered body contains samarium in a converted content calculated as samarium oxide of not lower than 0.04 mole percent and at least one second

rare earth element other than samarium, and wherein the molar ratio of a converted content of said second rare earth element calculated as rare earth oxide to said converted content of samarium calculated as samarium oxide (said converted content of said second rare earth element/said converted content of samarium) is not higher than 2.0.

64. The member of claim 63, wherein the molar ratio of total of converted contents of all the rare earth elements calculated as rare earth oxides to a calculated content of aluminum oxide (said total of converted contents of all the rare earth elements/said content of aluminum oxide) is 0.05 to 0.5.

65. The member of claim 63, wherein said second rare earth element is one or more element selected from the group consisting of yttrium, lanthanum, cerium, gadolinium, dysprosium, erbium and ytterbium.

66. The member of claim 63 containing crystalline phase of complex oxide of said second rare earth element and aluminum.

67. The member of claim 58, wherein said sintered body contains aluminum nitride grains with a mean diameter of not lower than $3\ \mu\text{m}$.

68. The member of claim 58, wherein the molar ratio of said converted content of samarium calculated as samarium oxide to a calculated content of aluminum oxide ($\text{Sm}_2\text{O}_3/\text{Al}_2\text{O}_3$) is 0.05 to 0.5.

69. The member of claim 58, wherein said sintered body has an activation energy of temperature dependency of volume resistivity from room temperature to $300\ ^\circ\text{C}$ of not higher than 0.4 eV.

70. The member of claim 58, comprising a substrate made of said aluminum nitride sintered body and a metal member embedded in said substrate.

71. The member of claim 70, wherein said metal member comprises at least an electrode for an electrostatic chuck.

72. The member of claim 58, wherein said sintered body has a lightness of not higher than N4 measured according to JIS Z8721.

73. The member of claim 58, wherein said sintered body contains one or more transition metal element selected from the group consisting of metal elements belonging to the periodic table IVA, VA, VIA, VIIA and VIIIA in a content calculated as metal element of not lower than 0.01 weight percent.

74. The member of claim 73, wherein said sintered body contains said transition metal element in a content calculated as metal element of not higher than 1.0 weight percent.

75. The member of claim 73, wherein said sintered body contains crystalline phase of the nitride of said transition metal element.